



RIDGE

EASTLANDS CAR PARK

**FLOOD RISK ASSESSMENT &
DRAINAGE STRATEGY REPORT**

April 2026

EASTLANDS CAR PARK FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY REPORT

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VERSION CONTROL

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1. EXECUTIVE SUMMARY

This report summarises the Flood Risk and details the Drainage Strategy for the proposed Eastlands Car Park at JLR Halewood.

Table 1 below provides a summary of the Flood Risk and Drainage / SuDS Strategy for the scheme.

Table 1 - Drainage / SuDS Summary

Item	Brief Description
Flood Zone	The site boundary lies entirely within Flood Zone 1 (low risk). According to the Environment Agency flood maps, there are portions of the site is at high risk of surface water flooding – this is discussed further in section 5.
Geology	The Geology of Britain Viewer indicates that the site is likely underlain by Till deposits over Bedrock Geology of the Kinnerton Sandstone.
Infiltration Rate	A Ground Investigation was undertaken by Beech Group Ltd, as part of this 4no. soakaway tests were undertaken across the site – these confirmed that infiltration is not a viable option. Furthermore, soakaways are not suitable for this site due to its historical use as a landfill.
Nearest Watercourses	There are some potential ditches shown approximately 200m in the woodland to the east of the site, however upon investigation these were shallow depressions that were silted up and had no positive outfall.
Nearest Adopted Sewers	United Utilities Sewer Records confirm are no adopted sewers on site.
Surface Water Outfall and SuDS Hierarchal Approach	Infiltration and a watercourse connection have both been discounted based on the information highlighted above. Therefore, the surface water from the proposed development is to discharge into a private surface water drainage network in the JLR site road to the west.
Existing SW Discharge Rate	The site does not have an existing positive drainage system and therefore should be classified as greenfield.
Proposed SW Discharge Rate	Greenfield runoff rates apply The surface water discharge will be limited to 25.2l/s (Qbar) .
Allowance for Climate Change	Lower Mersey Management Catchment , Upper End Allowance, 2070's • 3.3% AEP – 30% • 1% AEP 45% Applied to the modelled drainage calculations

Item	Brief Description
Proposed Attenuation Method and Volume	SW Attenuation Tank located beneath the external car parking area.
Maintenance Responsibility	JLR maintenance team as part of existing O&M Manual

There is a reduction in surface water flood risk from the development site to the surrounding area due to the reduction of existing storm water flow rates. Therefore, the development does not increase the risk of flooding to the other adjacent properties and roads. Out of chamber or gully flooding for the events in excess of the 100-year plus 45% climate change event may occur within the development site and is classed as exceedance flows. Flood water from this event will be contained within the development site until water levels recede.

2. INTRODUCTION

- 2.1 Ridge & Partners LLP have been appointed by JLR to prepare this Flood Risk Assessment (FRA) and Drainage Strategy Report to support the full planning application for the new Eastlands Car Park. The assessment has been undertaken in line with the new 'National Planning Policy Framework' (NPPF), plus the accompanying 'Flood Risk and Coastal Change' chapter of the National Planning Practice Guidance.
- 2.2 This report has been commissioned by JLR and is specific to their interests in the development proposals as described by the Proposed Site Plan in **Appendix A**.
- 2.3 The report has been commissioned to identify any drainage-related issues associated with the proposed development and which are subsequently addressed within this report.
- Identify available data relating to flood risk at the site.
 - Determine whether the site is at risk from flooding from all sources, including from breach or overtopping of any existing flood defences, surface water flooding and/or groundwater flooding.
 - Consider the flood risk from all other sources.
 - Determine the current surface water drainage regime and assess any potential increase in surface water runoff as a result of the proposed development.
 - Discuss Sustainable Drainage Systems (SuDS) as an option for reducing surface water flood risk.
 - Devise an appropriate outline surface water drainage strategy (including calculation where appropriate) to deal with any potential increase in surface water runoff and include for climate change.
 - Consider the recommendations of Knowsley Council's Strategic Flood Risk Assessment (SFRA).
 - Assess mitigation measures & off-site impacts and define any residual risks.

3. PLANNING POLICY AND CONSULTATION

3.1. Planning Policy Framework

- 3.1.1. The Environment Agency (EA) flood maps indicate that the site lies within Flood Zone 1, i.e. land defined as having an annual probability of fluvial flooding of less than 1 in 1000 in any year (<0.1%). As a requirement of the NPPF and accompanying National Planning Practice Guidance (NPPG), the proposed development must satisfy the requirements of the Sequential Test and where applicable the Exception Test.
- 3.1.2. Sequential Test:
Under the NPPF, Flood Zone 1 is defined as low probability flood risk. The proposal is for a new Car Park, which, in accordance with Annex 3: Flood Risk Vulnerability Classification, is categorised as 'Less Vulnerable'.
- 3.1.3. Placing both these criteria into Table 3 (Flood Risk Vulnerability and Flood Zone 'Compatibility'), Less Vulnerable development in Flood Zone 1 determines that 'Development is Appropriate'.
- 3.1.4. Exception Test:
As the Sequential Test is passed, the Exception Test is not required.

4. THE SITE

4.1. Site Details

- 4.1.1. The site details are summarised in **Table 2** below:

Table 2 - Site Referencing Information

Item	Brief Description
Site name	Eastlands Car Park
Site address and location	Jaguar Land Rover Halewood Speke Blvd Speke Liverpool L24 9BJ
Planning Authority	Knowsley Council
Lead Local Flood Authority	Knowsley Council
Drainage Statutory Undertaker	United Utilities
Site Area	5.12 Ha
Approximate Grid Reference	Easting: 345612, Northing: 384202

4.2. Site Description

- 4.2.1. The existing site and surrounding boundary conditions is shown **Figure 1**. The redline boundary denotes the application boundary.
- 4.2.2. The site itself is split into three parcels of land, each separated by metal fencing. The two main parcels of the site are covered by a combination of gravel and hardstanding. The far north of the site appears to have been recently cleared and gravelled to provide a storage area. Bunds of vegetated material are present along the eastern boundary.



Figure 1 - Aerial Photograph of Existing Site

4.3. Proposed Development

- 4.3.1. As discussed in the earlier sections, the report has been prepared to support the planning application for a new Car Park.
- 4.3.2. The proposed total site area is approximately 5.12ha (red boundary) as seen in **Figure 1**.
- 4.3.3. The current Proposed Site Plan in **Appendix A** provides an indication of the proposals of the site.

5. DEFINITION OF FLOOD HAZARD

5.1. Sources of information

- 5.1.1. The NPPF requires the developer to consider the impact of runoff generated by the proposed development onto the downstream catchment, and to assess the risk of runoff from the surrounding district impacting on the development footprint. Further, the report is to consider flood risk from all other sources. The following section defines the flood risk receptors and anticipated flood risk. Section 5 then discusses in further detail the probability of flooding and the likely impacts.

Table 3 - Sources of information used in the identification of flood risk

Source of Information	Details
Environment Agency Flood Map	Indicative Flood Maps
Knowsley Council	Report & Various Maps from the SFRA
United Utilities	Sewer Records Map
Historic Maps	From various websites

5.2. Flooding from Rivers (Fluvial)

- 5.2.1. **Figure 2** shows the site boundary on the Environment Agency's long-term flood risk map for rivers and the sea. It is clear from this that the red line boundary of the development sits outside of a fluvial generator of flood water from any identified water body or river. It is considered therefore that the overall site lays outside of the active 100-year and extreme event floodplains, thus lying within 'Flood Zone 1 Classification' in accordance with NPPF Guidance, i.e. probability of annual fluvial flooding significantly less than 1 in 1000 in any one year (<0.1%). The risk of fluvial flooding is therefore deemed negligible, and no further assessment of the fluvial flood regime is required.

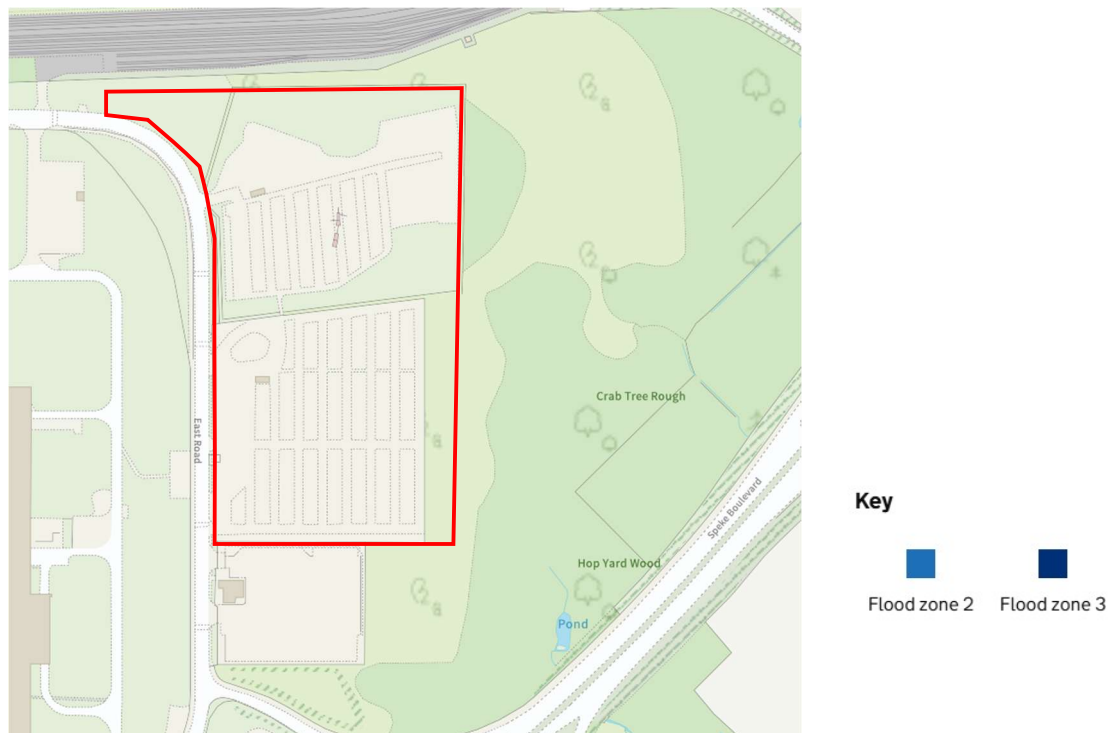


Figure 2 – The EA's Flood Risk Map – Rivers and Sea

5.3. Flooding From Land (Overland Flow)

- 5.3.1. Any surface water runoff from the surrounding area is captured by the existing Jaguar Land Rover drainage infrastructure and conveyed away from the site.
- 5.3.2. The Environment Agency indicative surface water flood map show that there are isolated areas of the site designated as currently being at risk of surface water flooding in the 1 in 1000-year event as illustrated in **Figure 3**. These areas depict topographical low points where surface water has the potential to pond and are associated with the existing undulating surface. The proposed on-site surface water drainage system will be designed to best practice and ensure there are no low spots where surface water will be able to pond in future. There are no existing flow routes through the site that need to be maintained.



Figure 3 – The EA's Flood Risk Map for the 1 in 1000 year – Surface Water

- 5.3.3. The proposed Surface Water Drainage Strategy is to be designed so that no surface water flooding / overland flow occurs up to the 1:30 year event. Exceedance flows beyond the 1:30 year up to the 1:100 year + climate change events are permitted to flood the surrounding hardstanding areas. However, these flows shall be retained on site. As such, by incorporating appropriate mitigation measures and designing the drainage strategy to current best practice guidance to ensure that any surface water flooding is controlled, the risk of flooding from overland flow is considered to be low.

5.4. Flooding from Sewers

- 5.4.1. A review of United Utilities (UU) sewer records confirms that there are no public sewers crossing the site that would need to be retained. Thus, flood risk to the site from sewers is diminished to acceptable levels.

5.5. Flooding from Groundwater

- 5.5.1. During the intrusive site investigations shallow groundwater was present in places across the site and dewatering works may be required to allow excavation.
- 5.5.2. It is considered that the water is perched within the made ground and is not continuous across the site.
- 5.5.3. Based on the information available and the proposed use of the development site, the risk of flooding from groundwater is considered to be low.

5.6. Flooding from Artificial Sources

- 5.6.1. There are no structural, hydraulic or geotechnical infrastructure within the site boundary.

6. ASSESSMENT OF FLOOD RISK ON DEVELOPMENT SITE (PROBABILITY)

6.1. Summary

Section 5 has defined the anticipated flood risks from all sources. **Table 4** below considers each of the sources and defines in tabular format the Probability of Flood Risk associated to each and the likely impacts to the proposed development. Below is a table summary of the flood risks associated with the development site.

Table 4 – Flood Risk Summary

Source	Flood Risk	Likely Impacts	Remarks
Tidal	Low	Low	Proposed development lies entirely within low-risk area.
Fluvial (Watercourse)	Low	Low	Proposed development lies entirely within low-risk area.
Overland Flow	Low to High	Low	Proposed development has areas of high risk surface water flooding, associated with topographical low points. There are no flow routes through the site that needs to be maintained. Mitigation measures discussed in section 5.
Sewers	Low	Low	No public sewers crossing the development site.
Groundwater	Low	Low	SI information indicate low risk of groundwater flooding.
Artificial Sources	Low	Low	No Artificial Sources in close proximity

7. OUTLINE DRAINAGE STRATEGY

7.1. Existing Surface Water Runoff

- 7.1.1. The existing site is approximately 5.12ha in area and is classified as greenfield land. Therefore, greenfield runoff rates apply.

Table 5 – Existing Greenfield Runoff Rates

Site Area (ha)	Qbar (l/s)	1 Year (l/s)	30 years (l/s)	100 years (l/s)
5.12	25.2	21.9	42.7	52.4

7.2. Geology

- 7.2.1. The Geology of Britain Viewer indicates that the site is likely underlain by Till deposits over Bedrock Geology of the Kinnerton Sandstone.
- 7.2.2. A Ground Investigation was undertaken by Beech Group Ltd, as part of this 4no. soakaway tests were undertaken across the site – these confirmed that infiltration is not a viable option. Furthermore, soakaways are not suitable for this site due to its historical use as a landfill.

7.3. Hydrology

- 7.3.1. There are some potential ditches shown approximately 200m in the woodland to the east of the site, however upon investigation these were shallow depressions that were silted up and had no positive outfall.

7.4. Existing Drainage

- 7.4.1. There are several private surface water drains in the estate road along the western boundary which convey surface water to the main JLR Halewood outfall point.

7.5. Sustainable Drainage Systems

- 7.5.1. SuDS Objectives
- Sustainable drainage developed in line with the ideals of sustainable development is collectively referred to as Sustainable Drainage Systems (SuDS). At a particular site, these systems are designed both to manage the environmental risks resulting from the urban runoff and to contribute wherever possible to environmental enhancement. SuDS objectives are therefore to minimise the impacts from the development on the quantity and quality of the runoff and maximise amenity and biodiversity opportunities (CIRIA C753, 2015).

7.5.2. SuDS's Design Themes

A strong design theme is essential if the maximum aesthetic benefits are to be gained from the SuDS approach. At a more local scale the SuDS should link with the individual plot structure, planting, public open space requirements and amenity areas, gaining multiple benefits from a limited area of land.

7.5.3. The SuDS Management Train

The 'Management Train Approach' should be central to the surface water drainage strategy of the proposed site. The main objective is treatment and control of runoff as near to the source as possible protecting downstream habitats and further enhancing the amenity value of the site. This concept uses a hierarchy of drainage techniques to incrementally reduce pollution, flow rates and volumes of storm water discharge from the site, and is as follows:

1. **Prevention** – The use of good site design and housekeeping measures to prevent runoff and pollution and includes the use of rainwater reuse / harvesting.
2. **Source Controls** – Control of runoff at source or as close to source as possible (e.g. soakaways, green roofs, pervious pavements).
3. **Site Control** – Management of water in a local area and can include below ground storage / attenuation, detention basins, large infiltration devices.
4. **Regional Control** – Management of water from a site or various sites and can include wetlands and balancing ponds.

7.5.4. SuDS Site Constraints

SuDS techniques are suitable for all sites; therefore, an assessment of the existing site is required so that SuDS limitations can be determined.

- Land Use Characteristics: The type of the development plot and existing contamination allows a limited range of source control and site control SuDS devices, with only below-ground drainage solutions considered suitable for implementation.
- Site Characteristics: Soakaways are not viable for use on this site.
- Catchment Characteristics: The site is classified as greenfield.
- Environmental and Amenity Performance: The inclusion of SuDS within the overall development is a key driver in providing both amenity and habitat creation. Safety to all future occupiers is paramount and so best practice guidance will be incorporated so that these devices blend into the surrounding without the need for significant safety precautions. Maintenance plans will be prepared for all SuDS devices that are included.

7.5.5. SuDS Methods

Tables 6 and 7, below, provide an assessment of various above and below ground SuDS methods that can provide water quality treatment and management of flows to reduce runoff rates and volumes and whether they can be suitably incorporated at this development site. The purpose of this assessment is to set out options to be considered at the planning stage with consideration to time constraints, viability and lifetime maintenance of the development.

Table 6 – Surface SuDS Methods

Method	Comment	Suitability for Development
Infiltration Options	Reduces total run off volume from the development.	<u>Not Suitable:</u> Ground conditions are not suitable for infiltration.
Permeable Surfacing (Infiltration)	- Reduces total run off volume from the development. - Can be used to enhance water quality.	<u>Not Suitable:</u> Ground conditions are not suitable for infiltration.
Permeable Surfacing (Standard)	- Can be used to enhance quality of runoff water. - Sub-base provides 'source' storage and reduces the volume of storage downstream. - The storage can be created with selection of the stone fill or use of plastic box stems. - Impermeable membrane at base of construction to prevent impact on pavement stability.	<u>Not Suitable:</u> Ground conditions are not suitable for infiltration.
Swales, basins and ponds	- Provide areas for above ground surface runoff storage. - Swales also improve water quality through filtration.	<u>Not Suitable:</u> Limited site space does not permit large above ground areas for surface water storage.
Bio Retention	- Reduced surface water pollution to the receiving water bodies. - Reduction in flooding from intense rainfalls. - Increased biodiversity.	<u>Not Suitable:</u> Limited site space does not permit large above ground areas for surface water storage.

Table 7 – Sub-Surface SuDS Methods

Method	Comment	Suitability for Development
Geocellular Storage	- Suitable for sites with insufficient space for basins etc. - Suitable for sites where topography prevents the use of open basins etc. - Can be very effective infiltration devices subject to ground conditions.	<u>Suitable:</u> The use of geocellular attenuation may be possible to retain excess storm water.

Large Diameter Pipes, Culverts or Tanks	• Suitable for sites with insufficient space for basins etc. • Provide a volume of below ground storage with a high void ratio and good man entry provision to allow for future maintenance and cleaning. • Generally suitable for adoption by the statutory water company.	<u>Suitable:</u> • The use of oversized pipes may be possible to retain excess storm water.
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7.5.6. SuDS Hierarchal Approach

Based on the SuDS assessment in **Tables 6 and 7**, plus an assessment of the local site conditions, the SuDS hierarchal approach for discharge of surface water at the development site is considered in greater detail below:

Table 8 – SuDS Hierarchal Approach

Method	Suitability	Suitability for Development
Infiltration to Ground	No	Underlying ground conditions deems this approach unsuitable. See section 7.2.
Connection to Watercourse	No	Ditches approximately 200m to the east have no positive outfall.
Connection to Surface Water Sewer/Private Drain	Yes	There is an existing surface water drainage network in the carriageway on the western boundary.
Connection to Combined Sewer/Private Drain	No	There is no combined drainage in close proximity to the site.

7.5.7. SuDS Design Philosophy

The SuDS assessment and hierarchal approach discussed in **Tables 6, 7 and 8** above has defined the overall SuDS strategy. Thus, the SuDS philosophy for the development site is the promotion of Prevention, Source Control and Site Control techniques with surface water to discharge into the existing network at a restricted rate.

The following design philosophy is proposed:

- Surface water treatment using the 'Management Train' approach to remove and isolate contamination at all SuDS facilities prior to conveyance to the ground.
- Site control in the form of geocellular storage and oversized pipes.
- Full retention separators are included at all outfall points on the site to clean and treat runoff.
- Aim to limit where possible the impermeable fraction of development.

7.6. Surface Water Drainage Strategy

- 7.6.1. This section should be read in conjunction with the 'Proposed Drainage Strategy' and the hydraulic calculations available in **Appendix C and D**.
- 7.6.2. A drainage strategy has been developed for the site to demonstrate that surface water runoff can be effectively managed within the site boundary, without increasing flood risk to the site or surrounding areas.
- 7.6.3. As outlined previously in section 7.1, surface water for the proposed development is to be discharged into the existing private surface water drainage network within the wider JLR site.
- 7.6.4. Based on best practice guidance, the post development runoff rate should be reduced to greenfield runoff rate for (Qbar) shown in **Table 9**.

Table 9: Post development SW Runoff Rate

Proposed Site Area (m2)	Post development SW run off (l/s)
5120	25.2 l/s (Maximum run off)

- 7.6.5. An infrastructure-based SW Drainage Strategy is considered feasible for the development, with run off from the hardstanding areas directed to the new below ground infrastructure. To achieve the post-development runoff rate (**Table 9**), flow control devices are to be situated at the downstream ends of the surface water network.
- 7.6.6. The flows from the proposed development are to be collected via series of drainage channels before being stored in oversized pipes and geocellular tanks. Thereafter, the surface water is to pass through full retention separators before discharging into the private surface water network at a maximum allowable rate of 25.2 l/s.
- 7.6.7. The proposed drainage layout for the new development has been designed in accordance with Design & Construction Guidance (DCG), BS EN 752: 2008 and Building Regulations Part H guidance, i.e. up to the 30-year storm return period criterion (including the % increase to account for climate change) and tested for the 1 in 100 year return period including a % increase to account for climate change.
- 7.6.8. Flooding can occur on a local scale beyond the 30-year criterion due to runoff exceeding the capacity of the minor system during extreme events and it can only be addressed on a site-specific basis. Design & Construction Guidance states that developments should be protected against flooding from extreme events (1 in 30 year) and that flood pathways are identified when the drainage system is exceeded. In the case of this development, the drainage has been designed such that there are no exceedance flows.
- 7.6.9. Any future drainage calculations carried out as part of a site-wide drainage strategy or for the development layouts themselves must include the appropriate increase in rainfall to satisfy the future Climate Change allowances.

8. MANAGEMENT MEASURES, OFF SITE IMPACTS AND RESIDUAL RISK

8.1. Flood Risk Management Measures

- 8.1.1. The report has found the site to be at low risk of flooding from all sources.
- 8.1.2. The surface water drainage strategy will restrict runoff from the Proposed development to greenfield runoff rate for Qbar, prior to discharge. Attenuation has been proposed in the form of geocellular storage tanks. The new surface water networks will be designed in line with current British Standard and Design & Construction Guidance up to the 100-year storm return period including an allowance for climate change.
- 8.1.3. The use of SuDS in the form of Source Control and Site Control measures, with controlled (restricted) outflow, will help to minimise the flood risk impact to the surrounding sewer network.
- 8.1.4. There will be a site management health and safety document prepared in respect of the final development. This will include the required maintenance regime for the on-site drains and drainage facilities such as the drainage channels, gullies, pipes, manholes and all SuDS features.

8.2. Off Site Impacts

- 8.2.1. Up to and including the 100-year plus increase in rainfall allowance due to climate change (CC) event, the report has justified that there is no risk of flooding.
- 8.2.2. Surface water runoff does not increase from the pre-development regime and utilises SuDS solutions to satisfy the site constraints, the proposed development will therefore not increase flood risk onto its locality.

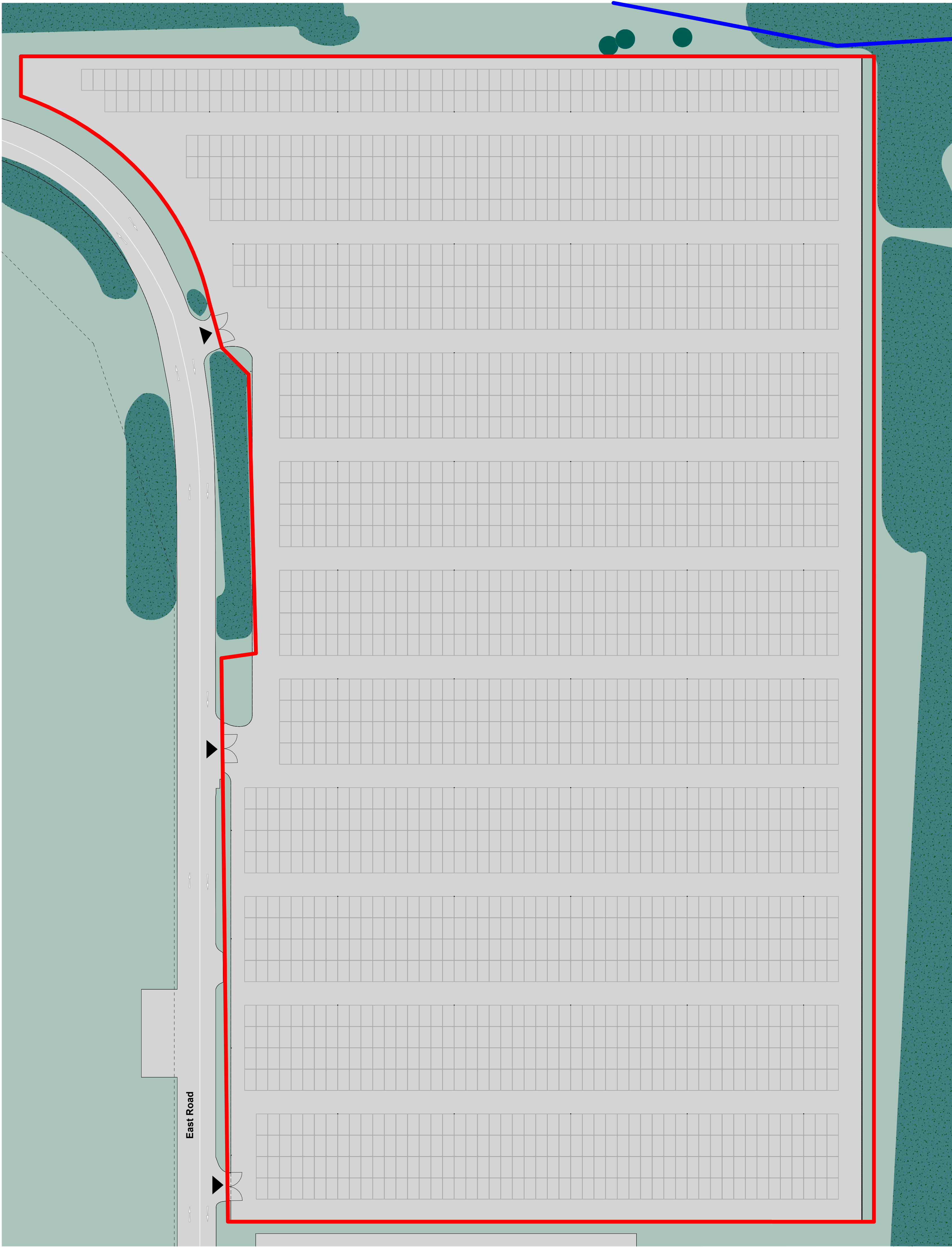
8.3. Residual Risk

- 8.3.1. With careful design of the drainage elements as described above there will be no residual flood-related risks that will remain after the development has been completed.

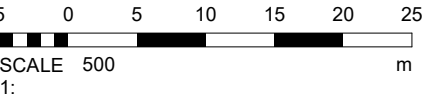
9. APPENDICES

- Appendix A – Architectural Site Layout
- Appendix B – Existing Site Information
- Appendix C – Ridge Design Drawings
- Appendix D – Hydraulic Calculations

APPENDIX A – ARCHITECTURAL SITE LAYOUT



PROPOSED SITE PLAN
1 : 500



KEY

- Site Boundary
- Ownership Boundary
- Site Entrance

- Tarmac Hardstanding
- Soft Landscaping
- Dense Shrubbery
- Trees

Reference Drawing

Topographical Survey: 'LST26001-D001'

NOTE: Refer to Arboriculturalist survey drawing 'UK0028072.5026-ARB-TSP' for details of existing soft landscaping.

Refer to Boundary Treatment Plan for perimeter fencing details.

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CLIENT:



IN ASSOCIATION WITH:

PROJECT:
EASTLANDS CARPARK

TITLE:

PROPOSED SITE PLAN

DRAWN BY:	KS	CHECKED BY:	KS	APPROVED BY:	KS
SCALE:	As indicated	@ A1	DATE:	01/30/26	
STATUS:	S2	DESCRIPTION:	PLANNING		

DRAWING No: ECP - RDG - A -

PROJECTNUMBER - ORIGIN - FUNC - SPATIAL - FORM - DIS - NUMBER
ECP- RDG-ZZ-ST-D-A-000103

REV:
P01

RIDGE PROJECT No:
ECP

REV: PLANNING ISSUE
REV: DESCRIPTION

27/03/26 KS KS
DATE BY CHKD

ORIGINATOR:

RIDGE

APPENDIX B – EXISTING SITE INFORMATION

The previous topographic surveying compiled Dec 2025 ref 4139-LR-TO-XM-X2-G0001-S2-P01 has not been checked for different or missing data with the exception of common detail survey points for the surveys.

Results showed that the existing Red Laser survey was in keeping with GPS derived accuracy and based on OSGB36(15).

The existing survey (4139-LR-TO-XM-X2-G0001-S2-P01) Red Laser is shown on this plan in grey, each layer has a prefix of 'LR'. All new data by Precision Land Surveys Ltd has prefix of 'PLS'.

Access to the stockpile and to the east and the ditch to the north was restricted by dense vegetation. Areas marked with 'X' on the map were not surveyed.

Precision Land Surveys Ltd have accessed areas where able and surveyed details visible although it is possible that some details have been omitted. We therefore accept no responsibility for missing details or for lack of information which could have impacted the stockpile volume calculation.

Datum : GPS controlled and based on existing Red Laser survey ref 4139-RL-TO-XX-M2-G-00001-S2-P01 which correlates to OSGB36-15 to the local scale factor.

Scale factor: Local

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PRECISION
LAND SURVEYS LTD

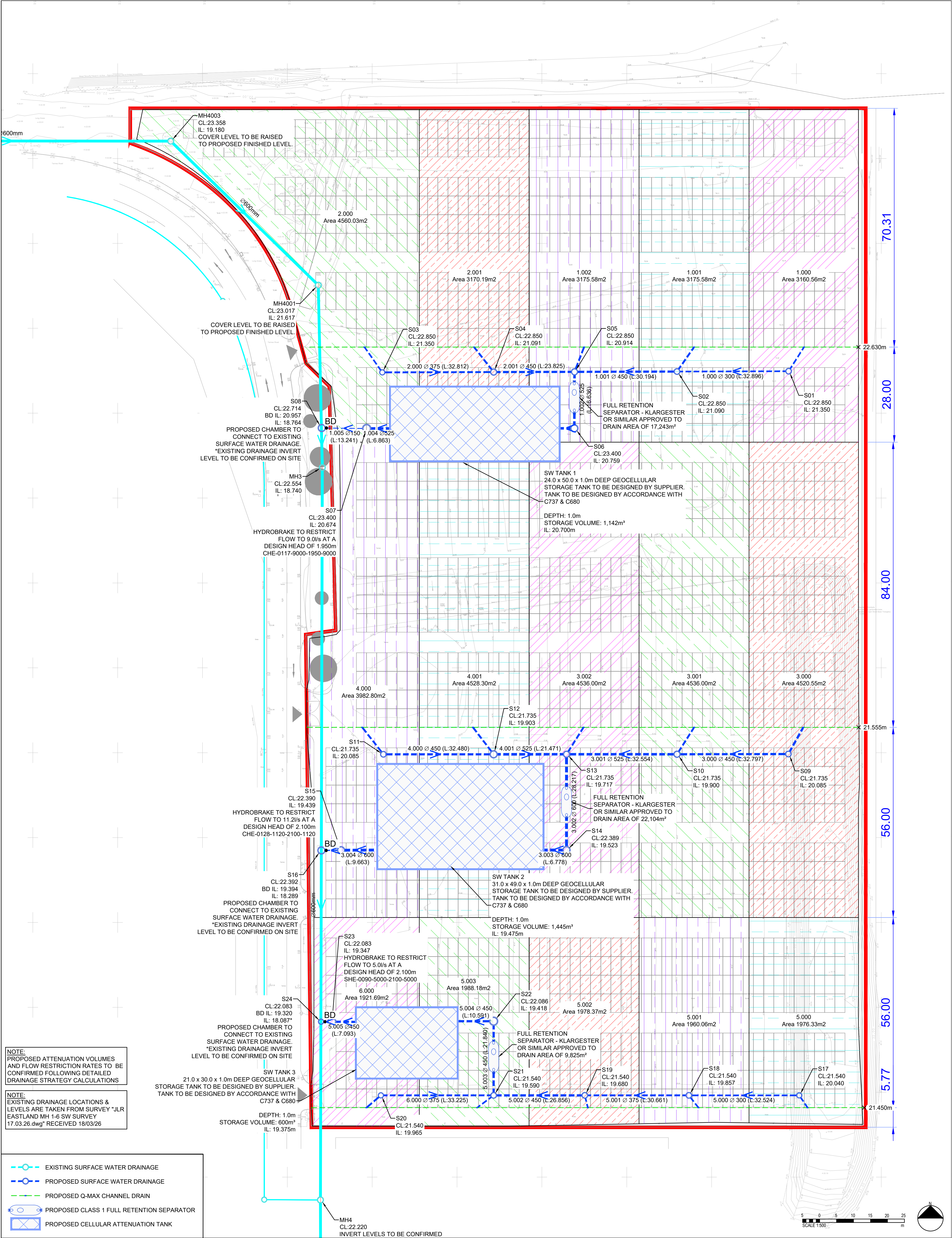
CLIENT:

JAGUAR LAND ROVER
HALEWOOD
L24 9BJ

Drawing Number:	Revision:
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Drawing Number: LST26001-D001		Revision: -
Scale: 1:200	Survey Date: 05/02/2026	Sheet: 3 of 4
Drawn: JWH		Checked: ZH

APPENDIX C – RIDGE DESIGN DRAWINGS



NOTE:
PROPOSED ATTENUATION VOLUMES
AND FLOW RESTRICTION RATES TO BE
CONFIRMED FOLLOWING DETAILED
DRAINAGE STRATEGY CALCULATIONS

NOTE:
EXISTING DRAINAGE LOCATIONS &
LEVELS ARE TAKEN FROM SURVEY "JLR
EASTLAND MH 1-6 SW SURVEY
17.03.26.dwg" RECEIVED 18/03/26

- EXISTING SURFACE WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED Q-MAX CHANNEL DRAIN
- PROPOSED CLASS 1 FULL RETENTION SEPARATOR
- PROPOSED CELLULAR ATTENUATION TANK

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CLIENT:
JLR

P02	NOTES ADDED	02.04.2026	LP	EDM
P01	INITIAL ISSUE	18.03.2026	LP	EDM
REV	DESCRIPTION	DATE	BY	CHKD

IN ASSOCIATION WITH:

PROJECT:
EASTLANDS CAR PARK

TITLE:
PROPOSED DRAINAGE LAYOUT

DRAWN BY:	LP	CHECKED BY:	EDM	APPROVED BY:	ED
SCALE:	1:500	@	A1	DATE:	18/03/2026

ORIGINATOR: www.ridge.co.uk

RIDGE

PROJECT NUMBER: 5031818

STATUS: DESCRIPTION:

S2 FOR INFORMATION

DRAWING No: 5031818-RDG-XX-XX-D-C-110501

PROJECT: ORG: FUNCTION: SPATIAL: FORM: DISCIPLINE: NUMBER: REV:
5031818 RDG XX XX D C 110501 P02

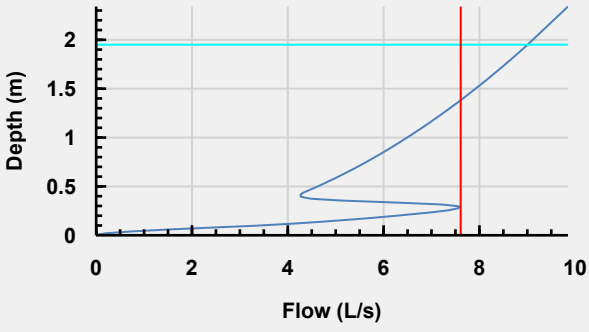
APPENDIX D – HYDRAULIC CALCULATIONS

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Storm Phase: Phase Flow Path: Network 1	Company Address:			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S01	Manhole	345647.713	384362.231	22.850	1.500	21.350	Circular	1.350
S02	Manhole	345614.800	384362.241	22.850	1.760	21.090	Circular	1.350
S05	Manhole	345584.609	384362.239	22.850	1.936	20.914	Circular	1.500
S06	Manhole	345584.564	384345.629	23.400	2.641	20.759	Circular	1.500
S07	Manhole	345523.365	384345.610	23.400	2.726	20.674	Circular	1.500
S08	Manhole	345508.763	384345.607	22.710	2.134	20.576	Circular	1.200

Name	Lock
S01	None
S02	None
S05	None
S06	None
S07	None
S08	None

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S01	Outlet	1.000	Free Discharge
S02	Outlet	1.001	Free Discharge
S05	Outlet	1.002	Free Discharge
S06	Outlet	1.003	Free Discharge
S07	Outlet	1.005	Hydro-Brake®
	Invert Level (m)	20.674	
	Design Depth (m)	1.950	
	Design Flow (L/s)	9.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0117-9000-1950-9000	
			

Project: JLR Eastlands	Date: 02/04/2026			
Report Details: Type: Stormwater Controls Storm Phase: Phase Flow Path: Network 1	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
	Company Address:			



TANK1

Type : Cellular Storage

Dimensions	
Exceedance Level (m)	23.400
Depth (m)	1.000
Base Level (m)	20.700
Number of Crates Long	24
Number of Crates Wide	50
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	1
Crate Height (m)	1
Total Volume (m³)	1141.700

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Storm Phase: Phase Flow Path: Network 1	Company Address:			

Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
1.000	32.914	Pipe	299.217		0.6	300	22.850	21.350
1.001	30.191	Pipe	300.000		0.6	450	22.850	21.090
Branch: 2.000								
2.000	32.834	Pipe	298.489		0.6	375	22.850	21.350
2.001	23.809	Pipe	236.588		0.6	450	22.850	21.090
1.002	16.610	Pipe	107.159		0.6	525	22.850	20.914
1.003	5.365	Pipe	90.936		0.6	525	23.400	20.759
1.004	7.914	Pipe	300.000		0.6	525	23.400	20.700
1.005	14.602	Pipe	150.000		0.6	150	23.400	20.674

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock	Flow Restriction (L/s)	Culvert Type	Culvert Entrance	Wall Thickness (mm)
1.000	22.850	21.240		Levels		(None)	(None)	0
1.001	22.850	20.989		Levels		(None)	(None)	0
Branch: 2.000								
2.000	22.850	21.240		Levels		(None)	(None)	0
2.001	22.850	20.989		Levels		(None)	(None)	0
1.002	23.400	20.759		Levels		(None)	(None)	0
1.003	23.400	20.700		Levels		(None)	(None)	0
1.004	23.400	20.674		Levels		(None)	(None)	0
1.005	22.710	20.576		Levels	9.8	(None)	(None)	0

Name	Material	Trench Width (mm)	Bedding Material	Surrounding Material
1.000		0		
1.001		0		
Branch: 2.000				
2.000		0		
2.001		0		
1.002		0		
1.003		0		
1.004		0		
1.005		0		

Project: JLR Eastlands		Date: 02/04/2026			RIDGE
		Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Inflow Summary Storm Phase: Phase Flow Path: Network 1		Company Address:			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
S01	S01		Time of Concentration	0.357	100	0	100	0.357
S02	S02		Time of Concentration	0.283	100	0	100	0.283
Branch: 2.000								
S03	S03		Time of Concentration	0.462	100	0	100	0.462
S04	S04		Time of Concentration	0.293	100	0	100	0.293
S05	S05		Time of Concentration	0.330	100	0	100	0.330
TOTAL		0.0		1.724				1.724

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address:			

Flow Options

Peak Flow Calculation	Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	100.0
Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.400

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Backdrop (m)	0.000
Max. Backdrop (m)	1.500
Use Flow Restriction	☒
Reduce Channel Depths	☒

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Title: Rainfall Analysis Criteria	Company Address:			

Runoff Type	Dynamic
Output Interval (mins)	15
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	0
Perform No Discharge Analysis	☐

Rainfall	
FSR	Type: FSR
Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.400
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	0.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Network 1	Company Address:			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S01	FSR: 1 years: +0 %: 30 mins: Summer	22.85 0	21.35 0	21.499	0.149	31.2	0.213	0.000	28.5	27.059	OK
S02	FSR: 1 years: +0 %: 30 mins: Summer	22.85 0	21.09 0	21.258	0.168	53.2	0.241	0.000	49.5	48.504	OK
S05	FSR: 1 years: +0 %: 30 mins: Summer	22.85 0	20.91 4	21.131	0.217	137.8	0.383	0.000	135.7	130.721	OK
S06	FSR: 1 years: +0 %: 30 mins: Summer	23.40 0	20.75 9	20.946	0.187	135.7	0.330	0.000	133.8	130.534	OK
S07	FSR: 1 years: +0 %: 960 mins: Summer	23.40 0	20.67 4	20.907	0.233	5.5	0.412	0.000	5.5	311.286	Surcharged
S08	FSR: 1 years: +0 %: 960 mins: Summer	22.71 0	20.57 6	20.640	0.063	5.5	0.000	0.000	5.5	311.253	OK

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Network 1	Company Address:			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S01	FSR: 30 years: +0 %: 30 mins: Summer	22.850	21.350	21.632	0.282	76.3	0.404	0.000	70.3	66.252	OK
S02	FSR: 30 years: +0 %: 30 mins: Summer	22.850	21.090	21.398	0.308	130.9	0.441	0.000	126.0	118.709	OK
S05	FSR: 30 years: +0 %: 30 mins: Summer	22.850	20.914	21.295	0.381	347.2	0.673	0.000	334.7	319.790	OK
S06	FSR: 30 years: +0 %: 960 mins: Summer	23.400	20.759	21.201	0.442	52.7	0.782	0.000	52.1	773.432	OK
S07	FSR: 30 years: +0 %: 960 mins: Summer	23.400	20.674	21.201	0.527	7.7	0.932	0.000	7.6	514.620	Surcharged
S08	FSR: 30 years: +0 %: 1440 mins: Winter	22.710	20.576	20.653	0.076	7.6	0.000	0.000	7.6	739.107	OK

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Network 1	Company Address:			



FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S01	FSR: 100 years: +45 %: 15 mins: Summer	22.850	21.350	22.854	1.504	49.6	5.810	3.664	197.3	95.268	Flood
S02	FSR: 100 years: +45 %: 960 mins: Winter	22.850	21.090	22.134	1.044	23.4	1.494	0.000	23.1	529.483	Surcharged
S05	FSR: 100 years: +45 %: 960 mins: Winter	22.850	20.914	22.134	1.220	62.4	2.155	0.000	61.6	1424.365	Surcharged
S06	FSR: 100 years: +45 %: 960 mins: Winter	23.400	20.759	22.134	1.375	61.6	2.429	0.000	61.3	1420.673	Surcharged
S07	FSR: 100 years: +45 %: 960 mins: Winter	23.400	20.674	22.133	1.460	7.7	2.579	0.000	7.6	603.154	Surcharged
S08	FSR: 100 years: +45 %: 960 mins: Winter	22.710	20.576	20.653	0.076	7.6	0.000	0.000	7.6	603.076	OK

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Summary Storm Phase: Phase Flow Path: Network 1			Company Address:	



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.000	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S01	S02	22.850	21.499	0.139	27.059	0.9	0.45	28.5	OK
1.001	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S02	S05	22.850	21.258	0.160	48.504	1.0	0.27	49.5	OK
1.002	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S05	S06	22.850	21.131	0.202	130.721	1.8	0.29	135.7	OK
1.003	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S06	TANK1	23.400	20.946	0.108	130.534	4.2	0.26	133.8	OK
1.004	FSR: 1 years: +0 %: 960 mins: Summer	Pipe	TANK1	S07	23.400	20.908	0.220	311.489	0.1	0.02	5.5	OK
1.005	FSR: 1 years: +0 %: 960 mins: Summer	Pipe	S07	S08	23.400	20.907	0.065	311.253	0.7	0.38	5.5	Surcharged

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Summary Storm Phase: Phase Flow Path: Network 1	Company Address:			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.000	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S01	S02	22.850	21.632	0.244	66.252	1.1	1.1	70.3	OK
1.001	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S02	S05	22.850	21.398	0.307	118.709	1.1	0.68	126.0	OK
1.002	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S05	S06	22.850	21.295	0.345	319.790	2.2	0.71	334.7	OK
1.003	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S06	TANK1	23.400	21.068	0.239	318.605	4.6	0.65	330.7	OK
1.004	FSR: 30 years: +0 %: 240 mins: Winter	Pipe	TANK1	S07	23.400	21.148	0.461	115.296	0.1	0.03	7.8	OK
1.005	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	S07	S08	23.400	21.175	0.079	739.107	0.8	0.52	7.6	Surcharged

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Summary Storm Phase: Phase Flow Path: Network 1	Company Address:			



FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.000	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	S01	S02	22.850	22.854	0.300	95.268	2.8	3.09	197.3	Flood
1.001	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S02	S05	22.850	22.066	0.450	223.451	1.5	1.32	244.6	Surcharged
1.002	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S05	S06	22.850	21.824	0.525	601.716	3.1	1.42	665.4	Surcharged
1.003	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S06	TANK1	23.400	21.269	0.486	598.875	4.6	1.28	648.9	OK
1.004	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	TANK1	S07	23.400	21.094	0.407	8.868	0.1	0.03	9.0	OK
1.005	FSR: 100 years: +45 %: 960 mins: Winter	Pipe	S07	S08	23.400	22.133	0.079	603.076	0.8	0.53	7.6	Surcharged

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Storm Phase: Phase Flow Path: Network 2	Company Address:			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S09	Manhole	345647.514	384249.520	21.735	1.650	20.085	Circular	1.350
S10	Manhole	345614.798	384249.478	21.735	1.835	19.900	Circular	1.500
S13	Manhole	345582.403	384249.523	21.735	2.018	19.717	Circular	1.500
S14	Manhole	345582.263	384221.316	22.390	2.867	19.523	Circular	1.500
S15	Manhole	345515.812	384221.225	22.390	2.951	19.439	Circular	1.500
S16	Manhole	345509.027	384221.152	22.390	2.996	19.394	Circular	1.200

Name	Lock
S09	None
S10	None
S13	None
S14	None
S15	None
S16	None

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S09	Outlet	3.000	Free Discharge
S10	Outlet	3.001	Free Discharge
S13	Outlet	3.002	Free Discharge
S14	Outlet	3.003	Free Discharge
S15	Outlet	3.005	Hydro-Brake®
	Invert Level (m)	19.439	
	Design Depth (m)	2.100	
	Design Flow (L/s)	11.2	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0128-1120-2100-1120	

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Stormwater Controls Storm Phase: Phase Flow Path: Network 2	Company Address:			



TANK2

Type : Cellular Storage

Dimensions	
Exceedance Level (m)	22.390
Depth (m)	1.000
Base Level (m)	19.475
Number of Crates Long	31
Number of Crates Wide	49
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	1
Crate Height (m)	1
Total Volume (m³)	1444.965

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Storm Phase: Phase Flow Path: Network 2	Company Address:			

Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
3.000	32.716	Pipe	300.000		0.6	450	21.735	20.085
3.001	32.395	Pipe	300.000		0.6	525	21.735	19.900
Branch: 4.000								
4.000	32.235	Pipe	300.000		0.6	450	21.735	20.085
4.001	21.634	Pipe	194.900		0.6	525	21.735	19.903
3.002	28.207	Pipe	145.397		0.6	600	21.735	19.717
3.003	7.898	Pipe	164.552		0.6	600	22.390	19.523
3.004	11.193	Pipe	310.927		0.6	600	22.390	19.475
3.005	6.786	Pipe	150.000		0.6	150	22.390	19.439

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock	Flow Restriction (L/s)	Culvert Type	Culvert Entrance	Wall Thickness (mm)
3.000	21.735	19.976		Levels		(None)	(None)	0
3.001	21.735	19.792		Levels		(None)	(None)	0
Branch: 4.000								
4.000	21.735	19.978		Levels		(None)	(None)	0
4.001	21.735	19.792		Levels		(None)	(None)	0
3.002	22.390	19.523		Levels		(None)	(None)	0
3.003	22.390	19.475		Levels		(None)	(None)	0
3.004	22.390	19.439		Levels		(None)	(None)	0
3.005	22.390	19.394		Levels	12.3	(None)	(None)	0

Name	Material	Trench Width (mm)	Bedding Material	Surrounding Material
3.000		0		
3.001		0		
Branch: 4.000				
4.000		0		
4.001		0		
3.002		0		
3.003		0		
3.004		0		
3.005		0		

Project: JLR Eastlands		Date: 02/04/2026			RIDGE
		Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Inflow Summary Storm Phase: Phase Flow Path: Network 2		Company Address:			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
S09	S09		Time of Concentration	0.458	100	0	100	0.458
S10	S10		Time of Concentration	0.466	100	0	100	0.466
Branch: 4.000								
S11	S11		Time of Concentration	0.444	100	0	100	0.444
S12	S12		Time of Concentration	0.465	100	0	100	0.465
S13	S13		Time of Concentration	0.383	100	0	100	0.383
TOTAL		0.0		2.216				2.216

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address:			

Flow Options

Peak Flow Calculation	Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	100.0
Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.400

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Backdrop (m)	0.000
Max. Backdrop (m)	1.500
Use Flow Restriction	☒
Reduce Channel Depths	☒

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Title: Rainfall Analysis Criteria	Company Address:			

Runoff Type	Dynamic
Output Interval (mins)	15
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	0
Perform No Discharge Analysis	☐

Rainfall		
FSR	Type: FSR	
Region	England And Wales	
M5-60 (mm)	20.0	
Ratio R	0.400	
Summer	☒	
Winter	☒	

Return Period	
Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	0.000
100.0	45.000
Storm Durations	
Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project: JLR Eastlands		Date: 02/04/2026			
		Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Network 2		Company Address:			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S09	FSR: 1 years: +0 %: 30 mins: Summer	21.73 5	20.08 5	20.228	0.143	40.0	0.205	0.000	36.9	34.695	OK
S10	FSR: 1 years: +0 %: 30 mins: Summer	21.73 5	19.90 0	20.096	0.196	77.6	0.346	0.000	72.5	70.067	OK
S13	FSR: 1 years: +0 %: 30 mins: Summer	21.73 5	19.71 7	19.969	0.252	180.1	0.445	0.000	175.1	167.940	OK
S14	FSR: 1 years: +0 %: 30 mins: Summer	22.39 0	19.52 3	19.754	0.231	175.1	0.409	0.000	170.7	167.570	OK
S15	FSR: 1 years: +0 %: 960 mins: Summer	22.39 0	19.43 9	19.688	0.249	6.6	0.441	0.000	6.6	393.294	Surcharged
S16	FSR: 1 years: +0 %: 960 mins: Summer	22.39 0	19.39 4	19.464	0.071	6.6	0.000	0.000	6.6	393.254	OK

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Network 2	Company Address:			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S09	FSR: 30 years: +0 %: 30 mins: Summer	21.73 5	20.08 5	20.339	0.254	97.9	0.363	0.000	93.7	84.885	OK
S10	FSR: 30 years: +0 %: 30 mins: Summer	21.73 5	19.90 0	20.259	0.359	193.4	0.635	0.000	180.5	171.386	OK
S13	FSR: 30 years: +0 %: 30 mins: Summer	21.73 5	19.71 7	20.164	0.447	442.3	0.790	0.000	421.9	411.194	OK
S14	FSR: 30 years: +0 %: 960 mins: Summer	22.39 0	19.52 3	19.987	0.464	67.7	0.819	0.000	67.6	994.085	OK
S15	FSR: 30 years: +0 %: 960 mins: Summer	22.39 0	19.43 9	19.987	0.548	9.7	0.968	0.000	9.6	666.408	Surcharged
S16	FSR: 30 years: +0 %: 120 mins: Summer	22.39 0	19.39 4	19.483	0.089	9.6	0.000	0.000	9.6	105.586	OK

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Network 2	Company Address:			



FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S09	FSR: 100 years: +45 %: 960 mins: Winter	21.735	20.085	21.735	1.650	16.7	2.483	0.122	16.7	381.514	Flood
S10	FSR: 100 years: +45 %: 960 mins: Winter	21.735	19.900	21.735	1.835	33.8	3.313	0.070	33.5	767.850	Flood
S13	FSR: 100 years: +45 %: 960 mins: Winter	21.735	19.717	21.735	2.018	80.5	3.575	0.009	79.4	1831.756	Flood
S14	FSR: 100 years: +45 %: 960 mins: Winter	22.390	19.523	21.735	2.212	79.4	3.908	0.000	78.8	1824.741	Surcharged
S15	FSR: 100 years: +45 %: 960 mins: Winter	22.390	19.439	21.735	2.296	11.7	4.057	0.000	11.4	757.209	Surcharged
S16	FSR: 100 years: +45 %: 960 mins: Winter	22.390	19.394	19.493	0.100	11.4	0.000	0.000	11.4	757.120	OK

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Summary Storm Phase: Phase Flow Path: Network 2	Company Address:			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
3.000	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S09	S10	21.735	20.228	0.137	34.695	0.9	0.2	36.9	OK
3.001	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S10	S13	21.735	20.096	0.186	70.067	1.1	0.26	72.5	OK
3.002	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S13	S14	21.735	19.969	0.242	167.940	1.6	0.31	175.1	OK
3.003	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S14	TANK2	22.390	19.754	0.131	167.570	3.8	0.32	170.7	OK
3.004	FSR: 1 years: +0 %: 960 mins: Summer	Pipe	TANK2	S15	22.390	19.689	0.231	393.593	0.1	0.02	6.6	OK
3.005	FSR: 1 years: +0 %: 960 mins: Summer	Pipe	S15	S16	22.390	19.688	0.074	393.254	0.8	0.46	6.6	Surcharged

Project: JLR Eastlands		Date: 02/04/2026		RIDGE	
		Designed by: L Pilsbury	Checked by: E Dale-Maude		Approved By: E Dale-Maude
Report Details: Type: Connections Summary Storm Phase: Phase Flow Path: Network 2		Company Address:			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
3.000	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S09	S10	21.735	20.339	0.268	84.885	0.9	0.5	93.7	OK
3.001	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S10	S13	21.735	20.259	0.365	171.386	1.1	0.65	180.5	OK
3.002	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S13	S14	21.735	20.164	0.422	411.158	2.0	0.74	421.9	OK
3.003	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S14	TANK2	22.390	19.919	0.252	409.129	4.0	0.77	412.9	OK
3.004	FSR: 30 years: +0 %: 360 mins: Winter	Pipe	TANK2	S15	22.390	19.954	0.497	248.103	0.1	0.03	9.8	OK
3.005	FSR: 30 years: +0 %: 120 mins: Summer	Pipe	S15	S16	22.390	19.869	0.093	105.586	0.8	0.67	9.6	Surcharged

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Summary Storm Phase: Phase Flow Path: Network 2			Company Address:	



FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Flow

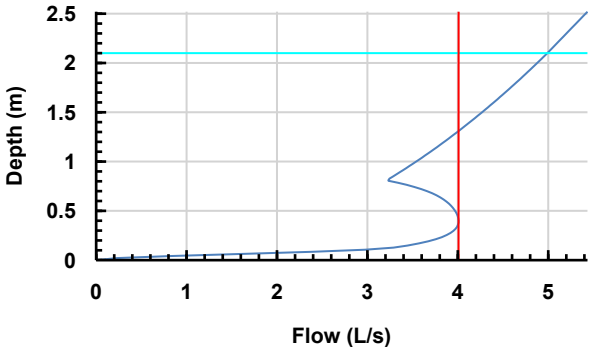
Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
3.000	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S09	S10	21.735	21.178	0.450	161.122	1.1	0.96	178.5	Surcharged
3.001	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S10	S13	21.735	21.044	0.525	323.773	1.7	1.29	360.3	Surcharged
3.002	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S13	S14	21.735	20.788	0.600	774.996	3.1	1.52	864.5	Surcharged
3.003	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S14	TANK2	22.390	20.099	0.500	770.097	5.0	1.65	884.8	OK
3.004	FSR: 100 years: +45 %: 960 mins: Winter	Pipe	TANK2	S15	22.390	21.735	0.600	760.238	0.1	0.03	11.7	Surcharged
3.005	FSR: 100 years: +45 %: 960 mins: Winter	Pipe	S15	S16	22.390	21.735	0.106	757.120	0.9	0.79	11.4	Surcharged

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Storm Phase: Phase Flow Path: Network 3	Company Address:			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S17	Manhole	345650.756	384149.058	21.540	1.500	20.040	Circular	1.200
S18	Manhole	345618.379	384149.086	21.540	1.683	19.857	Circular	1.350
S19	Manhole	345587.722	384149.227	21.540	1.860	19.680	Circular	1.350
S21	Manhole	345560.802	384149.283	21.540	1.950	19.590	Circular	1.500
S22	Manhole	345560.788	384170.957	22.086	2.668	19.418	Circular	1.500
S23	Manhole	345513.101	384170.735	22.086	2.739	19.347	Circular	1.500
S24	Manhole	345509.077	384170.735	22.086	2.766	19.320	Circular	1.200

Name	Lock
S17	None
S18	None
S19	None
S21	None
S22	None
S23	None
S24	None

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S17	Outlet	5.000	Free Discharge
S18	Outlet	5.001	Free Discharge
S19	Outlet	5.002	Free Discharge
S21	Outlet	5.003	Free Discharge
S22	Outlet	5.004	Free Discharge
S23	Outlet	5.006	Hydro-Brake®
	Invert Level (m)	19.347	
	Design Depth (m)	2.100	
	Design Flow (L/s)	5.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☒	
	Unit Reference	SHE-0090-5000-2100-5000	
			

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Stormwater Controls Storm Phase: Phase Flow Path: Network 3	Company Address:			



TANK3

Type : Cellular Storage

Dimensions	
Exceedance Level (m)	22.000
Depth (m)	1.000
Base Level (m)	19.375
Number of Crates Long	21
Number of Crates Wide	30
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	1
Crate Height (m)	1
Total Volume (m³)	600.125

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Storm Phase: Phase Flow Path: Network 3	Company Address:			

Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
5.000	32.377	Pipe	300.000		0.6	300	21.540	20.040
5.001	30.657	Pipe	300.000		0.6	375	21.540	19.857
5.002	26.920	Pipe	300.000		0.6	450	21.540	19.680
Branch: 6.000								
6.000	33.260	Pipe	110.865		0.6	375	21.542	19.965
5.003	21.675	Pipe	126.015		0.6	450	21.540	19.590
5.004	11.728	Pipe	272.733		0.6	450	22.086	19.418
5.005	8.290	Pipe	300.000		0.6	450	22.000	19.375
5.006	4.024	Pipe	150.000		0.6	150	22.086	19.347

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock	Flow Restriction (L/s)	Culvert Type	Culvert Entrance	Wall Thickness (mm)
5.000	21.540	19.932		Levels		(None)	(None)	0
5.001	21.540	19.755		Levels		(None)	(None)	0
5.002	21.540	19.590		Levels		(None)	(None)	0
Branch: 6.000								
6.000	21.540	19.665		Levels		(None)	(None)	0
5.003	22.086	19.418		Levels		(None)	(None)	0
5.004	22.000	19.375		Levels		(None)	(None)	0
5.005	22.086	19.347		Levels		(None)	(None)	0
5.006	22.086	19.320		None	5.4	(None)	(None)	0

Name	Material	Trench Width (mm)	Bedding Material	Surrounding Material
5.000		0		
5.001		0		
5.002		0		
Branch: 6.000				
6.000		0		
5.003		0		
5.004		0		
5.005		0		
5.006		0		

Project: JLR Eastlands		Date: 02/04/2026		RIDGE	
		Designed by: L Pilsbury	Checked by: E Dale-Maude		Approved By: E Dale-Maude
Report Details: Type: Inflow Summary Storm Phase: Phase Flow Path: Network 3		Company Address:			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
S17	S17		Time of Concentration	0.198	100	0	100	0.198
S18	S18		Time of Concentration	0.182	100	0	100	0.182
S19	S19		Time of Concentration	0.188	100	0	100	0.188
Branch: 6.000								
S20	S20		Time of Concentration	0.214	100	0	100	0.214
S21	S21		Time of Concentration	0.204	100	0	100	0.204
TOTAL		0.0		0.985				0.985

Project: JLR Eastlands		Date: 02/04/2026			
		Designed by: L Pilsbury	Checked by: E Dale-Maude		Approved By: E Dale-Maude
Report Details: Type: Network Design Criteria Storm Phase: Phase		Company Address:			

Flow Options

Peak Flow Calculation	Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	100.0
Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.400

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Backdrop (m)	0.000
Max. Backdrop (m)	1.500
Use Flow Restriction	☒
Reduce Channel Depths	☒

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Title: Rainfall Analysis Criteria	Company Address:			

Runoff Type	Dynamic
Output Interval (mins)	15
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	0
Perform No Discharge Analysis	☐

Rainfall	
FSR	Type: FSR
Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.400
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	0.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Network 3	Company Address:			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S17	FSR: 1 years: +0 %: 30 mins: Summer	21.54 0	20.04 0	20.146	0.106	17.3	0.120	0.000	15.6	14.981	OK
S18	FSR: 1 years: +0 %: 30 mins: Summer	21.54 0	19.85 7	19.992	0.135	31.5	0.194	0.000	28.9	28.779	OK
S19	FSR: 1 years: +0 %: 30 mins: Summer	21.54 0	19.68 0	19.840	0.160	45.3	0.229	0.000	43.3	43.012	OK
S21	FSR: 1 years: +0 %: 30 mins: Summer	21.54 0	19.59 0	19.764	0.174	79.2	0.308	0.000	74.2	74.728	OK
S22	FSR: 1 years: +0 %: 30 mins: Summer	22.08 6	19.41 8	19.606	0.188	74.2	0.332	0.000	71.7	74.375	OK
S23	FSR: 1 years: +0 %: 960 mins: Summer	22.08 6	19.34 7	19.575	0.228	3.6	0.402	0.000	3.6	199.749	Surcharged
S24	FSR: 1 years: +0 %: 960 mins: Summer	22.08 6	19.32 0	19.371	0.050	3.6	0.000	0.000	3.6	199.728	OK

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Network 3	Company Address:			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S17	FSR: 30 years: +0 %: 30 mins: Summer	21.54 0	20.04 0	20.225	0.185	42.3	0.209	0.000	40.5	36.612	OK
S18	FSR: 30 years: +0 %: 30 mins: Summer	21.54 0	19.85 7	20.094	0.237	79.4	0.340	0.000	73.8	70.331	OK
S19	FSR: 30 years: +0 %: 30 mins: Summer	21.54 0	19.68 0	19.972	0.292	113.9	0.418	0.000	108.7	105.265	OK
S21	FSR: 30 years: +0 %: 30 mins: Summer	21.54 0	19.59 0	19.905	0.315	196.9	0.557	0.000	184.4	182.505	OK
S22	FSR: 30 years: +0 %: 480 mins: Winter	22.08 6	19.41 8	19.861	0.443	33.3	0.784	0.000	32.9	377.397	OK
S23	FSR: 30 years: +0 %: 480 mins: Winter	22.08 6	19.34 7	19.861	0.514	4.1	0.909	0.000	4.0	194.781	Surcharged
S24	FSR: 30 years: +0 %: 120 mins: Summer	22.08 6	19.32 0	19.374	0.053	4.0	0.000	0.000	4.0	46.628	OK

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Network 3	Company Address:			



FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S17	FSR: 100 years: +45 %: 960 mins: Winter	21.54 0	20.04 0	21.540	1.500	7.2	1.865	0.169	7.2	166.041	Flood
S18	FSR: 100 years: +45 %: 960 mins: Winter	21.54 0	19.85 7	21.540	1.683	13.9	2.463	0.055	13.7	316.967	Flood
S19	FSR: 100 years: +45 %: 960 mins: Winter	21.54 0	19.68 0	21.540	1.860	20.6	2.672	0.010	20.0	467.839	Flood
S21	FSR: 100 years: +45 %: 960 mins: Winter	21.54 0	19.59 0	21.540	1.950	35.3	3.488	0.042	34.4	811.662	Flood
S22	FSR: 100 years: +45 %: 960 mins: Winter	22.08 6	19.41 8	21.542	2.124	34.4	3.753	0.000	34.2	805.774	Surcharged
S23	FSR: 100 years: +45 %: 960 mins: Winter	22.08 6	19.34 7	21.547	2.200	5.1	3.887	0.000	5.0	382.104	Surcharged
S24	FSR: 100 years: +45 %: 960 mins: Winter	22.08 6	19.32 0	19.381	0.060	5.0	0.000	0.000	5.0	381.992	OK

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Summary Storm Phase: Phase Flow Path: Network 3	Company Address:			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
5.000	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S17	S18	21.540	20.146	0.100	14.981	0.8	0.25	15.6	OK
5.001	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S18	S19	21.540	19.992	0.128	28.779	0.9	0.25	28.9	OK
5.002	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S19	S21	21.540	19.840	0.167	43.012	0.8	0.23	43.3	OK
5.003	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S21	S22	21.540	19.764	0.181	74.728	1.2	0.26	74.2	OK
5.004	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S22	TANK3	22.086	19.606	0.109	74.375	2.4	0.37	71.7	OK
5.005	FSR: 1 years: +0 %: 960 mins: Summer	Pipe	TANK3	S23	22.000	19.575	0.214	199.858	0.1	0.02	3.6	OK
5.006	FSR: 1 years: +0 %: 960 mins: Summer	Pipe	S23	S24	22.086	19.575	0.053	199.728	0.6	0.25	3.6	Surcharged

Project: JLR Eastlands	Date: 02/04/2026			
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Summary Storm Phase: Phase Flow Path: Network 3	Company Address:			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
5.000	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S17	S18	21.540	20.225	0.173	36.612	1.0	0.63	40.5	OK
5.001	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S18	S19	21.540	20.094	0.227	70.331	1.1	0.64	73.8	OK
5.002	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S19	S21	21.540	19.972	0.304	105.265	1.0	0.58	108.7	OK
5.003	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S21	S22	21.540	19.905	0.314	182.453	1.6	0.64	184.4	OK
5.004	FSR: 30 years: +0 %: 30 mins: Winter	Pipe	S22	TANK3	22.086	19.725	0.267	180.508	2.7	0.89	174.2	OK
5.005	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	TANK3	S23	22.000	19.598	0.237	5.236	0.1	0.02	4.3	OK
5.006	FSR: 30 years: +0 %: 120 mins: Summer	Pipe	S23	S24	22.086	19.788	0.056	46.628	0.7	0.28	4.0	Surcharged

Project: JLR Eastlands	Date: 02/04/2026			RIDGE
	Designed by: L Pilsbury	Checked by: E Dale-Maude	Approved By: E Dale-Maude	
Report Details: Type: Connections Summary Storm Phase: Phase Flow Path: Network 3	Company Address:			



FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
5.000	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S17	S18	21.540	20.791	0.300	69.373	1.0	1.15	73.3	Surcharged
5.001	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S18	S19	21.540	20.618	0.375	132.567	1.3	1.22	140.1	Surcharged
5.002	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S19	S21	21.540	20.415	0.450	197.451	1.3	1.14	211.2	Surcharged
5.003	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S21	S22	21.540	20.249	0.450	339.879	2.2	1.23	355.4	Surcharged
5.004	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	S22	TANK3	22.086	19.921	0.450	336.175	3.3	1.81	352.1	Surcharged
5.005	FSR: 100 years: +45 %: 60 mins: Summer	Pipe	TANK3	S23	22.000	20.048	0.450	25.014	0.1	0.03	5.6	Surcharged
5.006	FSR: 100 years: +45 %: 960 mins: Winter	Pipe	S23	S24	22.086	21.547	0.063	381.992	0.7	0.35	5.0	Surcharged



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